

AMENDMENTS TO THE SPECIFICATION

Please replace the following paragraphs in the specification in their entirety. Applicant respectfully submits that no new matter has been added by these amendments.

[0006]

In such a dot recording device, an edge portion process is performed in which to record dots on a main scan line at a leading edge or trailing edge of the printing medium, ink drops are ejected from at least a portion of a recessed portion nozzle group composed of nozzles that are situated facing the recessed portion, while the leading edge or trailing edge is positioned over an opening of the recessed portion. In the edge portion process, a first unit scan operation is executed a plurality of times in which one or more main scannings are performed to record dots on a plurality of main scan lines that include two or more main scan lines adjacent to one another, and an edge portion process sub-scan is performed by a first feed distance at the interval between first unit scan operations. With such an arrangement, printing up to the edges of printing paper without margins can be carried out without depositing ink drops on the platen, using nozzles situated at locations facing the recessed portions. Additionally, switching between edge portion and midsectional portion print modes can be carried out easily.

[0058]

In the trailing edge process, printing is carried out using only nozzles at locations facing the upstream recessed portion (see FIG. 9 and FIG. 10). Accordingly, ink drops ejected from nozzles do not become deposited on the platen, even if they are not deposited on the printing paper. Thus, even in the event that the printing paper has not been advanced properly, ink drops will not become deposited on the platen in the trailing edge process.

[0064]

If, on the other hand, in Step S24 it is determined that there is no leading edge portion line among subsequent leading edge process unit lines, in Step S30, alignment feed by a feed distance Sf1 is performed. This alignment feed is performed in such a way that the main scan line at the leading edge of the midsectional process unit band moves to a relative position aligned

with the main scan line at the upper edge of the midsectional portion. Subsequently, in Step S32, a unit scan operation is performed using all nozzles of nozzles #1 - #13, whereupon the system transitions to the midsectional process. In the example of FIG. 13, the sub-scan feed coming after the pass 8 represents the alignment feed of Step S30. In the example of FIG. 13, the feed distance Sf1 of the alignment feed is 3 dots. The unit scan operation that includes passes 9 -12 represents the unit scan operation of Step S32. The main scan line of the trailing edge of leading edge portion Rf (in the example of FIG. 13, line 18) corresponds to the "main scan line situated a predetermined distance from the leading edge of the printing medium" recited in the Claims. This transition from the leading edge process to the midsectional process is executed by means of transition portion 41a1 of leading edge processing portion 41a (see FIG. 3).

[0081]

When printing of the trailing edge portion of printing paper P concludes in FIG. 9 (pass 16 in FIG. 15), the trailing edge Pr of printing paper P is situated at a location one line downstream (i.e., upward in FIG. 15) from nozzle #8 (see FIG. 9). Graphics data has been provided up to the range indicated by the broken lines in FIG. 9 (two lines upstream from the line directly below nozzle #10). Accordingly, if dots are recorded in the final pass 16 in this state, ink drops Ip ejected from nozzles #10 -#13 will descend into upstream recessed portion 26f.

[0088]

FIG. 18 is a flow chart illustrating the steps in a leading edge process in a second embodiment. In the process of the first embodiment shown in FIG. 12, if no leading edge portion line is present among the leading edge process unit lines (Step S24), the alignment feed of Step S30 is performed (refer to the sub-scan feed after pass 8 in FIG. 13). In Embodiment 2, however, when transitioning from the leading edge process to the midsectional process, in Step S31, leading edge process sub-scanning is performed in the same manner as previously, without performing alignment feed. In other respects, the hardware arrangement and process steps are the same as in Embodiment 1.

[0089]

FIG. 19 is an illustration showing the manner of recording graphics data areas corresponding to the leading edge portion and midsectional portion of the printing paper in the second embodiment. Up to pass 8, the process is carried out in the same manner as in FIG. 13 of Embodiment 1. Subsequent to pass 8, in Step S24 in FIG. 18, it is determined that there is no leading edge portion line in the leading edge process unit lines when the next leading edge process sub-scan was performed. Thereupon, in Step S31, a leading edge process sub-scan of feed distance Sf is performed, and in Step S32 a unit scan operation is performed using nozzles #1 - #13. The unit scan operation that includes passes 9 -12 represents the unit scan operation of Step S32. By means of this arrangement as well, efficient transition from the leading edge process to the midsectional process is possible. With this arrangement, nozzles do not pass

multiple times over main scan lines in proximity to the boundary of midsectional portion Rm and leading edge portion Rf. Thus, dots are efficiently recorded on main scan lines.

[0090]

In Embodiment 1 and Embodiment 2, main scan line pitch is smaller than nozzle pitch. In Embodiment 3, however, main scan line pitch and nozzle pitch are equal. That is, nozzle pitch is 1 dot. In each of the upper edge process, midsectional process and trailing edge process, the unit scan operation is composed of a single main scan. In other respects, the hardware arrangement and printing process steps are the same as in Embodiment 1.

[0098]

Feed distance of the sub-scan performed during a unit scan operation is not limited to 1 dot as described in Embodiment 1, and may instead consist of 3 dots, as in FIG. 21, or of some other feed distance. However, in preferred practice, nozzle pitch and feed distance of the sub-scan performed during a unit scan operation, each represented in terms of "dots" will be prime from each other.